INSTALLATION GUIDE

ETX-200

DVB-T Terrestrial Processor

English

design for TV

Contents

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1 Introduction

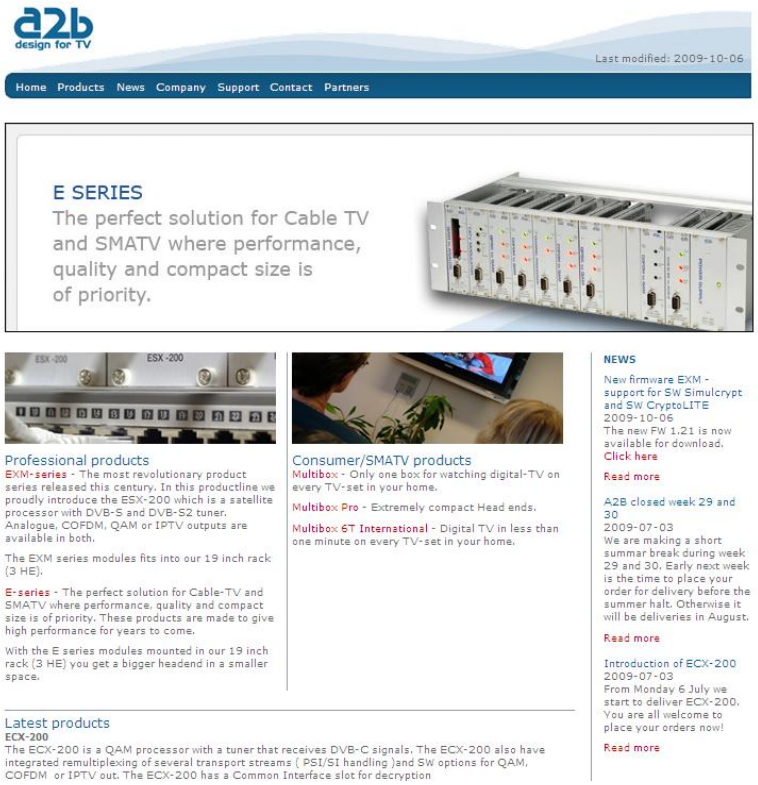
Thank you for purchasing an A2B Electronics product. The ETX-200 is a revolutionary solution for reception and modification of terrestrially transmitted TV-content into various transmission formats for cable-TV and SMATV.

The ETX-200 is delivered with hardware and software that supports DVB-T reception, MPEG2/MPEG4 H.264 AVC, ASI output, VSB RF modulation with NICAM or A2 audio, SNMP Interface, IP control and management. All hardware needed for upgrade with software options is available from the start. See section 7 SW options for more information.

ETX-200 can be upgraded for enhanced functionality and various formats for transmission and processing of digital-TV content by upgrade of its firmware. Software options will be available from A2B Electronics, please ask us for the specifications and complete price list of all options.

A2B Electronics AB
Phone: +46 (0)141 229115
E-mail: support@a2b.se

Also visit our web site www.a2b.se for further support.


a2b
design for TV
Last modified: 2009-10-06
Home Products News Company Support Contact Partners
E SERIES
The perfect solution for Cable TV and SMATV where performance, quality and compact size is of priority.
Professional products
Consumer/SMATV products
Latest products
NEWS

2 Unpacking the unit

Following components are included in the package:

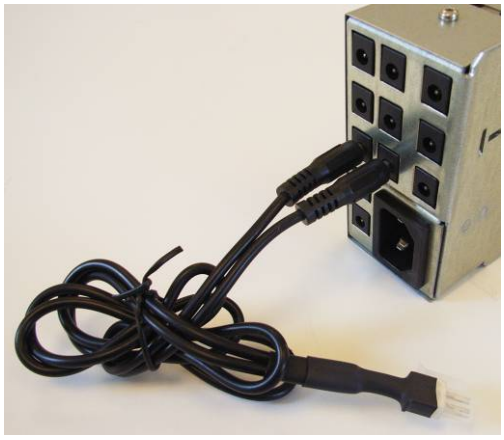
Amount	Description
1	ETX-200 Terrestrial Processor
1	Installation guide
2	Front panel screws

NOTE! There is no SW CD, nor any Controll Software CD. The unit is delivered with all necessary SW embedded including web server for control and settings of the unit.

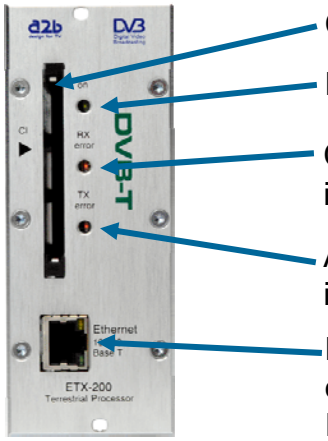
Every unit is quality controlled by us before delivery. Should any items be missing when unpacking please contact our support service (see page 3 for contact info).

Important information about power supply to ETX-200

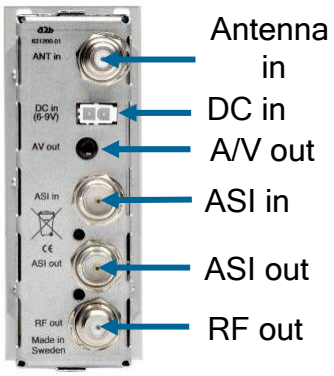
To avoid problems with ETX-200 and/or EPP-100 it is very important that both DC plugs on the EXM power cord are inserted into the EPP-100, i.e. each EXM unit needs to be fed from two DC outputs at the rear end of EPP-100. (See picture to the right).
NOTE! Never connect two EPP units to feed one ETX-200



3 Connections and indications



Front panel view of ETX-200



Rear panel view of ETX-200

Common Interface	Insert your Common Interface Conditional Access module into this slot
Power on indicator	Green light indicates that power is on.
Rx error	Red light indicates that the receiver is not locked to the terrestrial transmission.
Access/Tx error	Red light indicates that the smart card is not authorised or that decryption is not working properly.
Ethernet port	Ethernet for connection to a PC or handheld device with web browser
Antenna in	Connect your outdoor aerial to this input.
RF out	Connection to Cable TV or SMATV network.

3 Connections and indications (continued)

A/V out *) Connection for monitoring or to an RF modulator.

ASI in *) Input for ASI (Asynchronous Serial Interface) for high speed transport stream reception.

ASI out Output for ASI (Asynchronous Serial Interface) for high speed transport stream transmission.

DC in Connect a DC voltage to this input (6-10V).

**) Optional function i.e. SW option is needed*

NOTE! *We recommend to use only A2B original power supply for correct functionality and life cycle. Warranty will be void in case of damages caused by power supplies not supplied by A2B.*

4 Settings

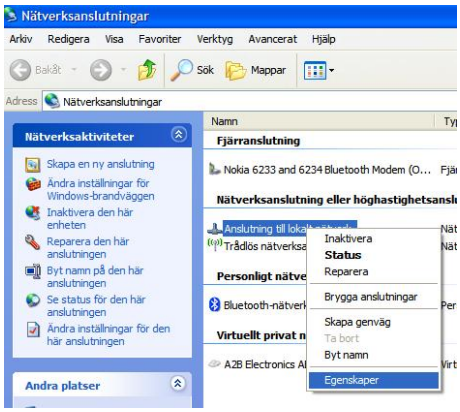
ETX-200 has an embedded web server allowing standard web browsers
(Internet Explorer, Firefox, Opera etc.) to connect to the unit for settings and management.
No controller software is needed.
The ETX-200 has by default a static IP address for connecting your PC to the unit.

The ETX-200 is delivered with IP address: 192.168.0.20. First time installation requires that you set a static IP address on your computer. For example set your PC to IP address: 192.168.0.19 and Net mask: 255.255.255.0

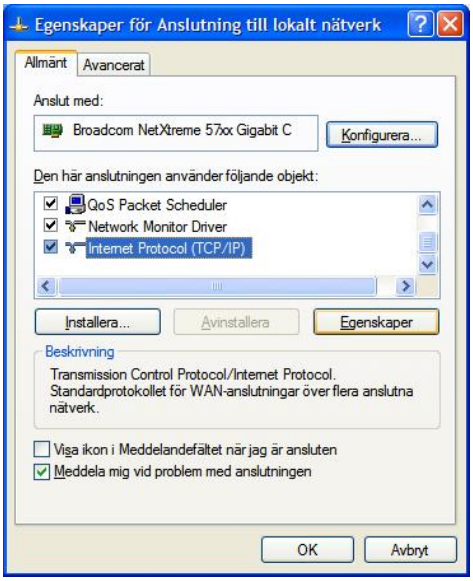
4 Settings (continued)

4.1 TCP/IP settings for Windows XP (setting your PC to 192.168.0.19)

Click ”Start”, select ”Control panel” and select ”Network connections” and then select “Network and Internet settings”.”Right click” on [Settings for local network] and select [Properties].

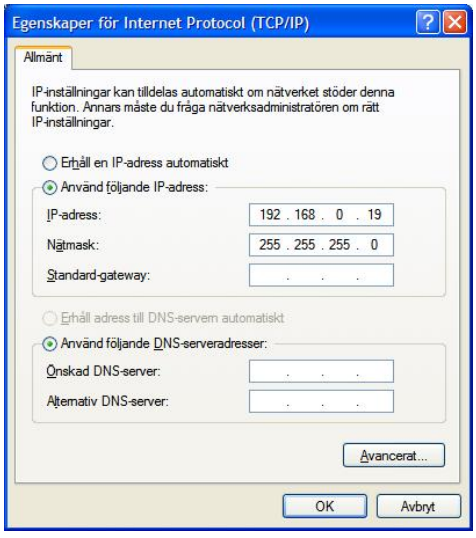


In Properties click [Internet protocol (TCP/IP)] and select [Properties].


Egenskaper för Anslutning till lokalt nätverk
Allmänt Avancerat
Anslut med:
Broadcom NetXtreme 57xx Gigabit C
Konfigurera...
Den här anslutningen använder följande objekt:
QoS Packet Scheduler
Network Monitor Driver
Internet Protocol (TCP/IP)
Installera... Avinstallera Egenskaper
Beskrivning
Transmission Control Protocol/Internet Protocol. Standardprotokollet för WAN-anslutningar över flera anslutna nätverk.
Visa ikon i Meddelandefältet när jag är ansluten
Meddela mig vid problem med anslutningen
OK Avbryt

Select [Use this IP adress] and write: 192.168.0.19 and select [Net mask] 255.255.255.0. Click [OK] and then click [Close].

NOTE! *For PC with other Operating Systems (OS) than Windows, please consult the Owners manual for your PC for [IP/Network settings].*


Egenskaper för Internet Protocol (TCP/IP)
Allmänt
IP-inställningar kan tilldelas automatiskt om nätverket stöder denna funktion. Annars måste du fråga nätverksadministratören om rätt IP-inställningar.
Erhåll en IP-adress automatiskt
Använd följande IP-adress:
IP-adress: 192 . 168 . 0 . 19
Nätmask: 255 . 255 . 255 . 0
Standard-gateway:
Erhåll adress till DNS-servern automatiskt
Använd följande DNS-serveradresser:
Önskad DNS-server:
Alternativ DNS-server:
Avancerat...
OK Avbryt

4.2 Connecting your PC to ETX-200

Connect the ETX-200 to a DC power supply (EPP-100).
See section 6 for installation.
Next connect your PC to the ETX-200 with a network cable.
Start your web browser (IE, Firefox, Opera etc.) and write the IP address 192.168.0.20 in the address field in your browser.

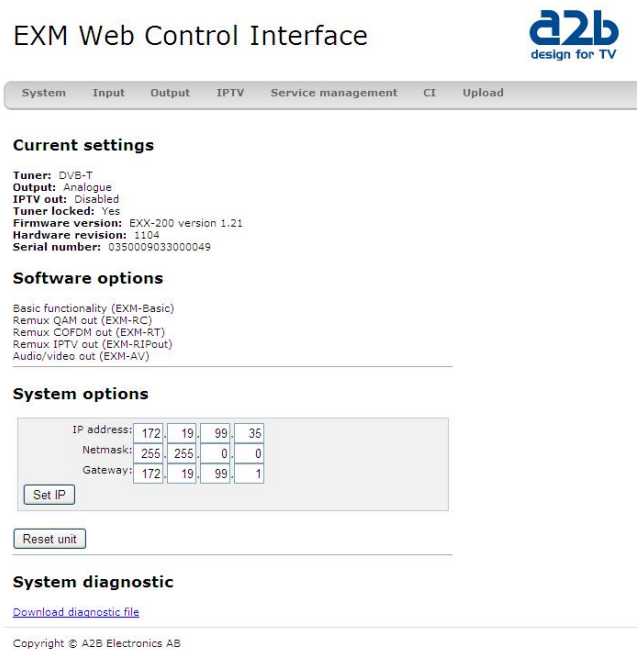
4 Settings (continued)

4.3 EXM Web Control Interface

4.3.1 System menu

The following **[System]** menu should appear when you connect to the ETX-200. The **[System]** menu contains basic information about current settings and SW options.

Menu buttons for **[Input]**, **[Output]**, **[IPTV]**, **[Service management]**, **[CI]** and **[Upload]** are available at the top of the menu.



Current settings
Contains information of current input and output signals, if the tuner is locked to a signal, serial number and firmware revision.

Software options
Show what software options that are available in this unit (e.g. output signal format, input signal etc.) See section 7 for more information.

System options
This menu contains current IP address for the ETX-200.

[Reset unit] gives a possibility to restart the unit at any time.

[System diagnostic]
By a click on the ”Download diagnostic file” you can save a file that you can email to support@a2b.se for analysis if there is a problem with a unit.

4.3.2 IP address settings

The ETX-200 is set to an default IP address from factory (192.168.0.20). However, it is possible to change the IP address and/or the Netmask and/or the Gateway. This is an important function when you install two or more EXM units in a Head End and want to connect all units together through a switch or a router.

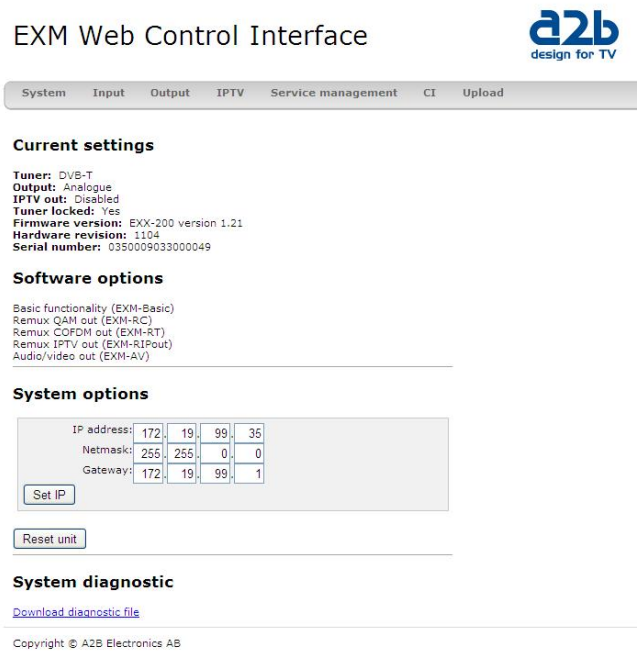
4 Settings (continued)

IP address settings (continued)

Setting new static IP address in the ETX-200

Connect your PC to each EXM unit after that you have done all other settings in the units and change to a specific IP address for every unit.
A recommendation is to use from 192.168.0.21 and higher.

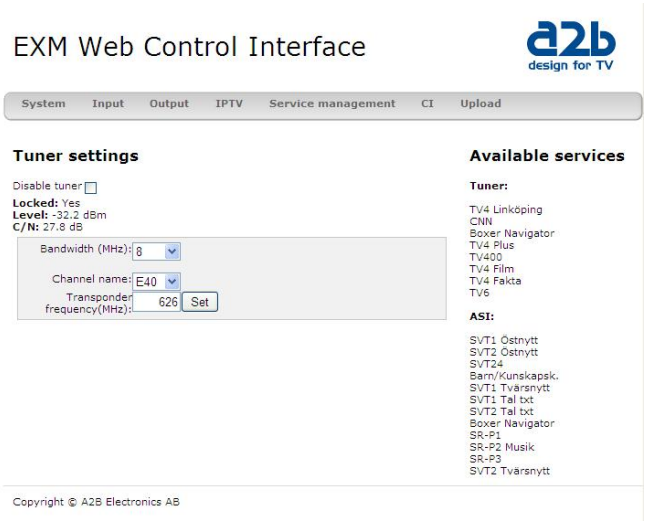
NOTE! *Almost every switch/router use 192.168.0.1 as default IP address so make sure you don't use the same IP address in any ETX-200 unit.*



To continue settings press **[Input]**

4.3.3 Tuner settings

Select the bandwith of the channel you want to receive. Next select the channel number according to CCIR or enter the correct frequency (in MHz). Be sure to press [Set] to enter the frequency to the ETX-200.
A list of the available services from the multiplex you tuned to, will be shown on the right hand side.
Below [Tuner settings] information of the received signal is displayed.



If only ASI in is used you can Disable the tuner

Note! We recommend that the [Level] reading is better than -55 dBm and C/N better than 25 dB for best performance.

4 Settings (continued)

We suggest that you consult your local terrestrial operator for correct parameters for each multiplex you want to receive.

Click **[Output]** to continue with the output settings.

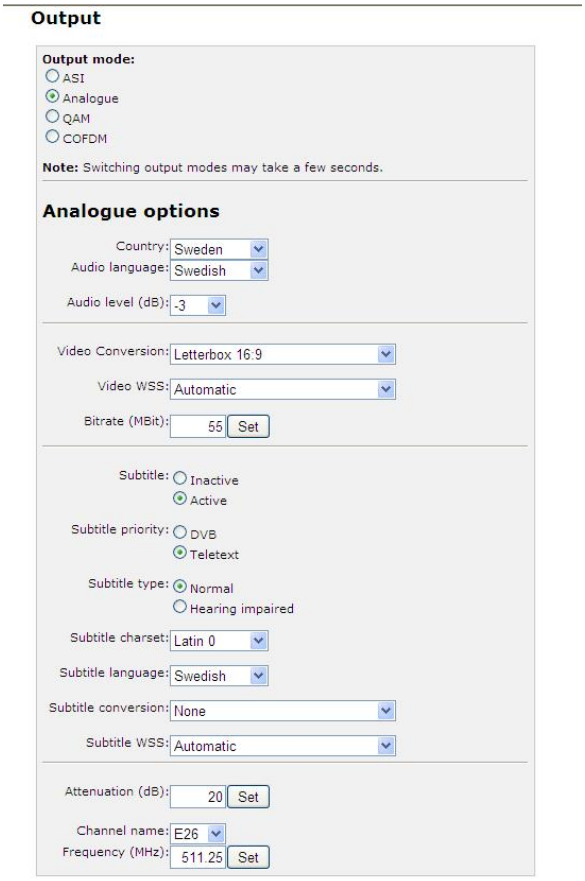
4.3.4 Output settings

ASI mode

The output selection ASI disables all RF modulation on the outputs and all selected services will be transmitted only through the ASI output connector. ASI is a high speed interface for digital TV transport streams. Use this output mode if you run IPTV out.
Under **[ASI options]** you can select the output bitrate which is the same bitrate as for IPTV out.

Analogue mode

The selection **[Analogue]** is set as factory default as RF output .
You can select output **[Channel name]** (E2 to E69) or **[Frequency]** within steps of 1 kHz (for example 306,167 MHz). Country specific settings can be done by selecting **[Country]**. By selecting a specific country, transmission standard and languages are automatically preset.
[Audio language] gives you the choosen language if there is more than one language ín the received signal.
In this menu you can also do settings for **Subtitling** priority, type, charset, language, conversion and subtitle WSS.



4 Settings (continued)

4.3.5 Analogue mode (cont.)

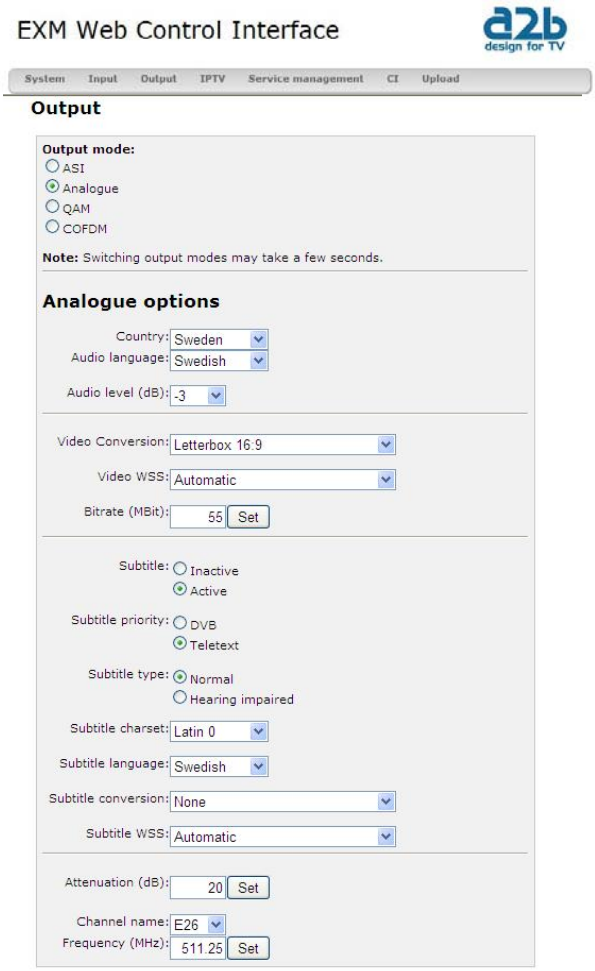
It is possible to select scaling of the picture format to fit with connected TV-sets. This is handled in the **[Aspect ratio]** drop down list where it's possible to choose between the different types. **[WSS]** (Wide Screen Signalling) is available in the video for signalling the aspect ratio to be displayed by the TV sets.

[Bitrate] can be set and this gives you what the bitrate will be at the ASI output.

NOTE! Refer to the table in page 16 about correct values.

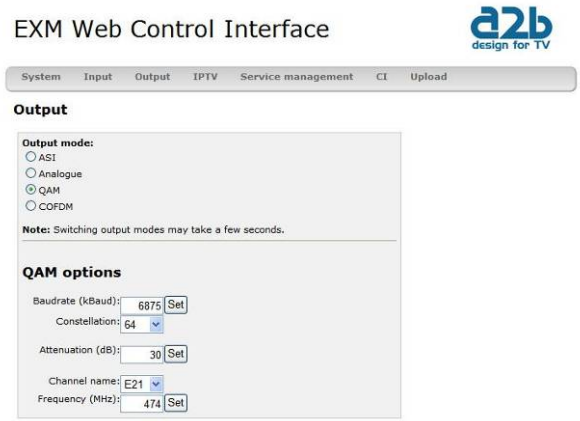
[Attenuation] can be choosed between 0 to -31 dB

The **[Frequency]** can be set in steps of 1kHz (e.g. 306.167 MHz) in all three output modes (Analogue, COFDM or QAM). Click **[Set]** to save all settings.



QAM mode (SW option)
When selecting **[QAM]** DVB-C output, there are settings for Output channel (E2 to E69) or Frequency, QAM mode (16, 32, 64, 128 or 256QAM), Baud rate (kHz) and Output signal attenuation (0 to -31dB).

Note! Some of the choices may need optional software to be uploaded before they can be selected.



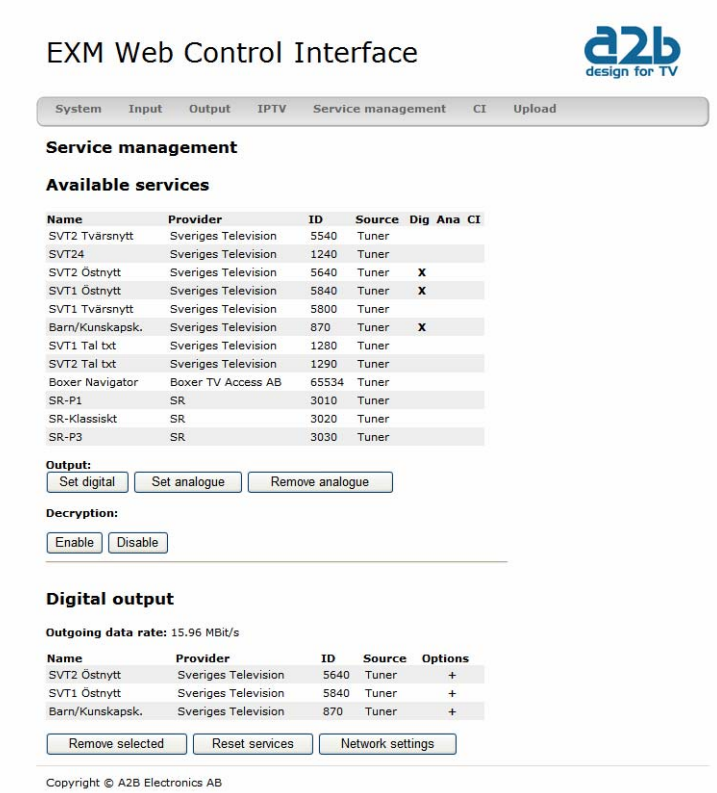
4 Settings (continued)

COFDM mode (SW option)
For **[COFDM]** (DVB-T) output you can select Output channel (E2 to E69) or Frequency and Output signal attenuation (0 to -31dB). You can also select bandwidth (6,7 or 8 MHz). For max recommended output bitrate see page 16.
Click **[Set]** to save settings.

Click **[Service management]** to select service(s) and or create new multiplexes.

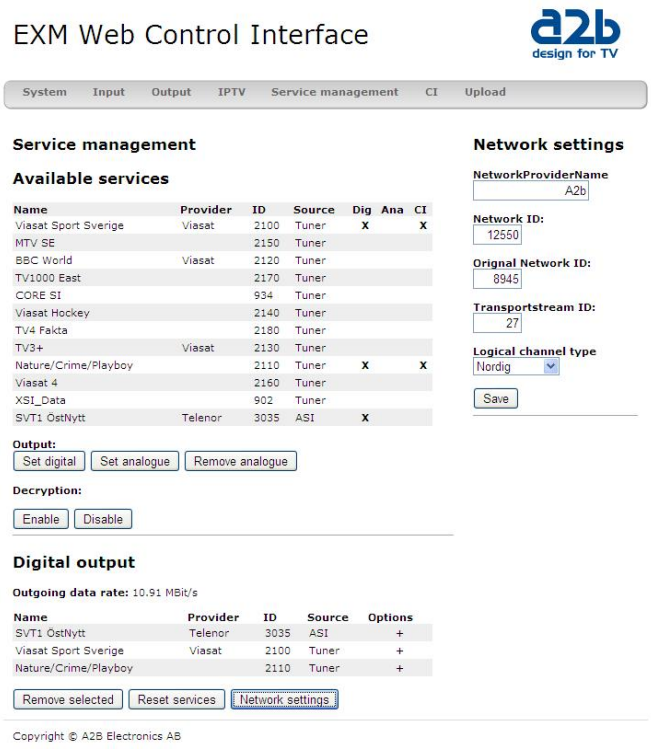
4.3.5 Service Management

The Service management menu gives an overview of available services from antenna input or the ASI input (if enabled). Remultiplexing (remuxing) is possible after downloading a appropriate SW option. To build your own MUX you combine several incoming services. These can be received either from the tuner or from the ASI in. Under the **[Digital output]** section in this meny you can see the actual "Outgoing data rate". This helps you to avoid overload for the output (see page 16 for information).


EXM Web Control Interface
a2b design for TV
System Input Output IPTV Service management CI Upload
Service management
Available services
Name Provider ID Source Dig Ana CI
SVT2 Tvärsnytt Sveriges Television 5540 Tuner
SVT24 Sveriges Television 1240 Tuner
SVT2 Östnytt Sveriges Television 5640 Tuner X
SVT1 Östnytt Sveriges Television 5840 Tuner X
SVT1 Tvärsnytt Sveriges Television 5800 Tuner
Barn/Kunskapsk. Sveriges Television 870 Tuner X
SVT1 Tal txt Sveriges Television 1280 Tuner
SVT2 Tal txt Sveriges Television 1290 Tuner
Boxer Navigator Boxer TV Access AB 65534 Tuner
SR-P1 SR 3010 Tuner
SR-Klassiskt SR 3020 Tuner
SR-P3 SR 3030 Tuner
Output:
Set digital Set analogue Remove analogue
Decryption:
Enable Disable
Digital output
Outgoing data rate: 15.96 MBit/s
Name Provider ID Source Options
SVT2 Östnytt Sveriges Television 5640 Tuner +
SVT1 Östnytt Sveriges Television 5840 Tuner +
Barn/Kunskapsk. Sveriges Television 870 Tuner +
Remove selected Reset services Network settings
Copyright © A2B Electronics AB

4 Settings (continued)

In the menu section *Available services* all services the unit receives, both from the **[Tuner input]** and from the **[ASI input]** is listed.
To select the service or services you want at the **[Digital output]** mark a service by clicking the line where the service is presented and than click the “Set digital” button. Now an “**X**” should appear in the “**Dig**” column. Do the same to choose a service as “Analogue out”. Make your choice of which services you want to select as outputs and you will see the selected service(s) in the **[Digital output]** list in the menu.



The ASI output contains the services you have selected for **[Digital output]**.

For decryption you mark the service by a click on the service name line and by clicking on “Enable” under the **[Decryption]** headline.

Note! *To decrypt more than one service requires a multidecryption CA module and a smartcard that is activated for more than one service. Some smartcards can handle two or three services at a time. Please, refer to your smartcard service provider for further information.*

Network settings

Click the **[Network settings]** button to display the Network settings menu. Here you can write Network Provider Name, Network ID, Original Network ID, TransportStream ID and select Logical channel type. When one or more choices has been made, you have to click on **[Save]** to store your settings.

The DVB standard recommends following Network ID ranges:
DVB-S: 0 to 8191 (0 should be avoided)
DVB-T: 8193 to 13568 (Boxer in Sweden use 8945)
DVB-C: 40961 to 65281 (ComHem in Sweden 41001 and up)

The ETX-200 is designed to perform remultiplexing fully automatically of both audio and video streams as well as full remultiplexing and regeneration of PSI/SI data.

The advantage for you as a user is much lower risk of failure and the process is much less time consuming.

4 Settings (continued)

4.3.5 LCN settings

Before starting, ensure that you have selected the correct **[Logical channel type]** (see page 13).For setting the LCN (Logical Channel Number) you click on the **[+]** sign under the column named **[Options]**. In the box under the label **[Logical channel number]** you write the LCN number you want for the service you have chosen and click the **[Set]** button.

Note! LCN is not supported in all DVB receivers i.e. refer to your manufacturer for specification for the DVB receivers in your cable TV network.

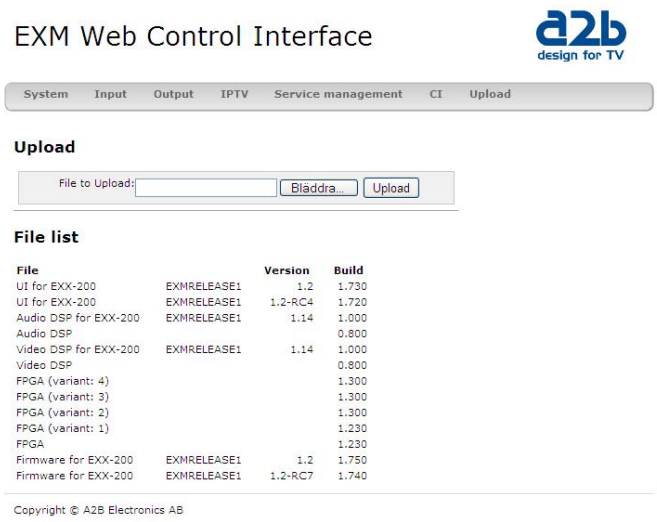
4.3.6 Upload

Update of the ETX-200 firmware or upload of enhanced functionality is done via the Upload menu.

NOTE! Always read the Instructions carefully before starting an upgrade.

Select **[Browse]** and search for the correct file on your computer. When the file is selected press **[Upload]** and the file is uploaded into the ETX-200. When upload is ready you should get a message “Upload completed”. Always do a power reset after finished upload to ensure that the ETX-200 reboots with the uploaded software.

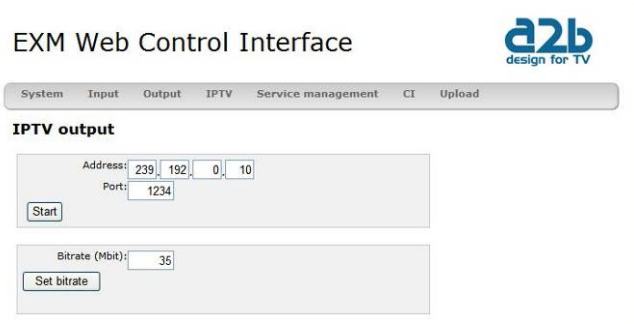
Please refer to the installation information for each specific SW.


EXM Web Control Interface
a2b design for TV
System Input Output IPTV Service management CI Upload
Upload
File to Upload:
Bläddra...
Upload
File list
File Version Build
UI for EXX-200 EXMRELEASE1 1.2 1.730
UI for EXX-200 EXMRELEASE1 1.2-RC4 1.720
Audio DSP for EXX-200 EXMRELEASE1 1.14 1.000
Audio DSP 0.800
Video DSP for EXX-200 EXMRELEASE1 1.14 1.000
Video DSP 0.800
FPGA (variant: 4) 1.300
FPGA (variant: 3) 1.300
FPGA (variant: 2) 1.300
FPGA (variant: 1) 1.230
FPGA 1.230
Firmware for EXX-200 EXMRELEASE1 1.2 1.750
Firmware for EXX-200 EXMRELEASE1 1.2-RC7 1.740
Copyright © A2B Electronics AB

4 Settings (continued)

4.2.6 IPTV output (SW option)

This menu allows for settings required to transmit a digital-TV transport stream as IPTV. IPTV output is optional and can be ordered separately as a SW option (see chapter 7, SW Options).

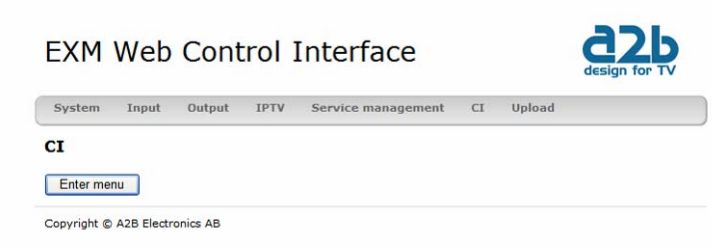


For IPTV out you have to set **[UDP/RTP]** values for Port and Address. For example: IP address 239.192.0.10 and Port 1234. In the box named ”Bitrate” you can choose what bitrate you want on the IPTV TS out and the maximum value is 55Mb/s. Click **[Set bitrate]** to save settings. Click on **[Start]** to get the IPTV stream on the output (RJ 45 connector). To check the IPTV out signal you can use a player like VLC Player. We recommend that you visit our website www.a2b.se for updated info about this function.

Note! *To avoid overload it’s not recommended to run other RF output at the same time i.e. choose ASI as Output. The choosen bitrate will be the same on the ASI output*

4.2.7 CI and Smart card information

This menu allows you to view information about your CA System and current subscriptions etc.


EXM Web Control Interface
a2b design for TV
System Input Output IPTV Service management CI Upload
CI
Enter menu
Copyright © A2B Electronics AB

5 About remultiplexing

To be sure that you don't exceed maximum bit rate for an output MUX, please control that you don't select to many services.

The table below gives max bit rates for COFDM and QAM out from ETX-200. Due to bit rate fluctuations from statistical multiplexing, we recommend that you only use 85% of the maximum available bit rate

Output signal	Modulation	Baudrate/BW	Max bitrate (Mb/s)	85%
COFDM	64QAM	8 MHz	31,67	26,92
COFDM	64QAM	7 MHz	27,71	23,55
COFDM	64QAM	6 MHz	23,75	20,19
QAM	16QAM	6.875 Mbaud/s	25,34	21,54
QAM	32QAM	6,875 Mbaud/s	31,68	26,93
QAM	64QAM	6.875 Mbaud/s	38,01	32,31
QAM	128QAM	6.875 Mbaud/s	44,35	37,70
QAM	256QAM	6.875 Mbaud/s	50,69	43,08

Table 1. Max bit rates for COFDM and QAM.

The formula for calculating QAM output bitrate is: [Baudrate x "A"/(204/188)] where "A" is 4 for 16QAM, 5 for 32QAM, 6 for 64QAM, 7 for 128QAM and 8 for 256QAM mode.

6 Installation

The ETX-200 can be installed either as a stand alone unit (Wall mount plate) or in base unit (EBU-100).

Before connecting power to the ETX-200, make sure that all other connections have been made. A coaxial cable of good quality with a F-connector should be connected from the aerial to the Antenna input and another one from the RF output to the cable TV network. Connect a power supply and make all necessary settings as described in section 4.

Note! Important information in page 4 about connecting the DC cable.

Installation in a base unit with 5 EXM modules and common power supply.

Accessories

EPP-100 power supply100W, 11 outputs

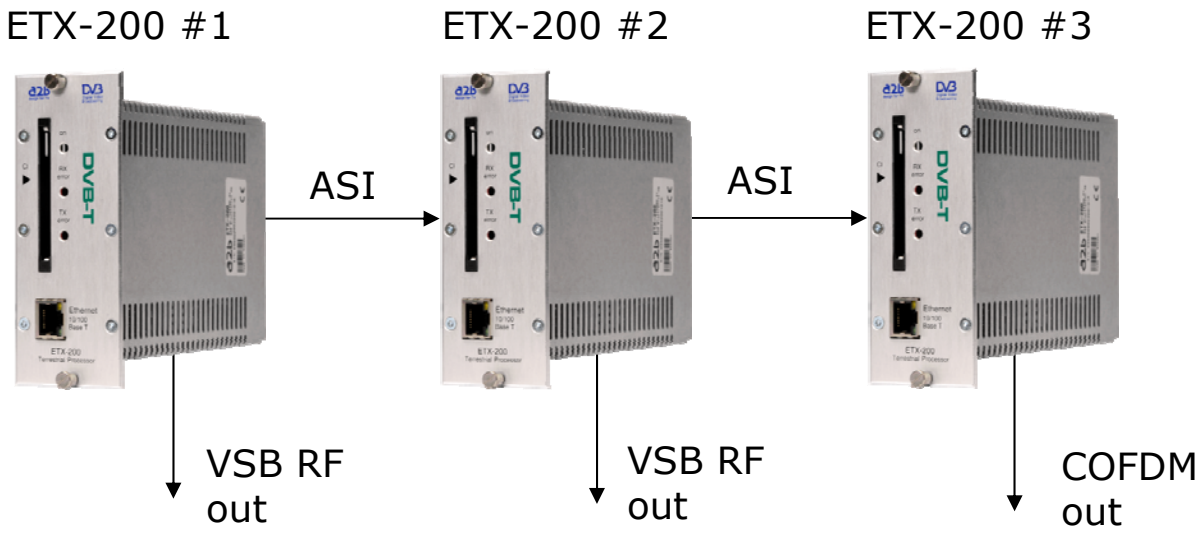
Wall mount plate

DC-cable for ETX-200

EBU-100 Base unit for 5 ETX-200 modules and power supply

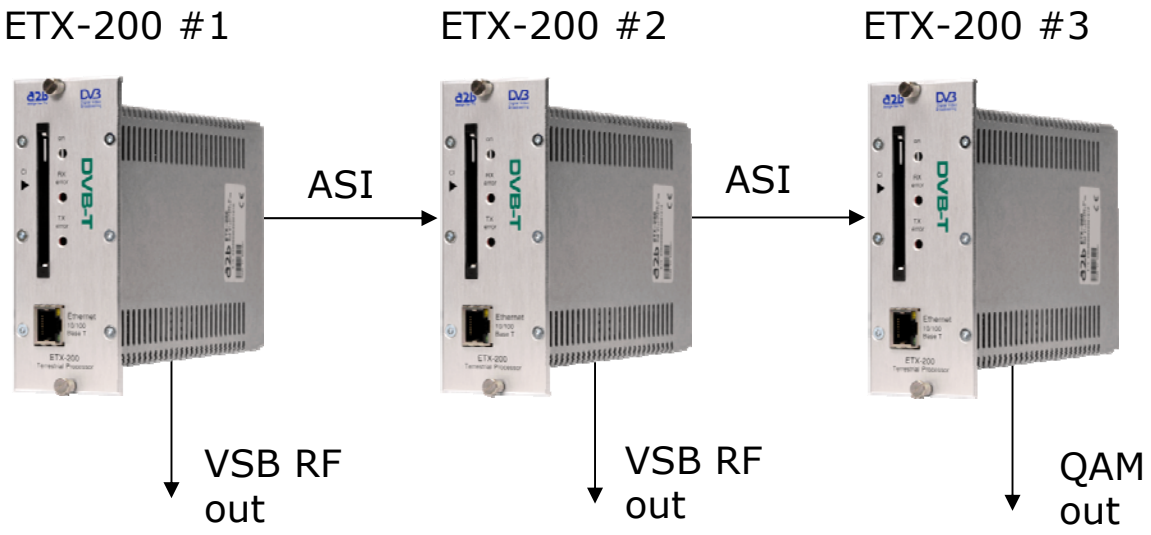
6.1 Installation examples

6.1.1 Installation of 3 pcs of ETX-200 and one COFDM mux out.



NOTE! Unit #2 and unit #3 has SW option for enhanced functionality with ASI in and COFDM out. VSB RF is default modulation format.

6.1.2 Installation of 3 pcs of ETX-200 and one QAM mux out.

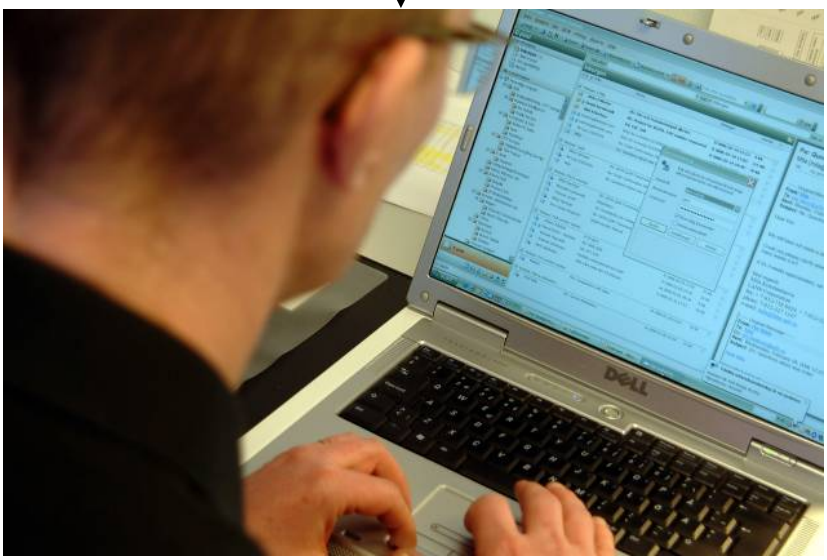


NOTE! Unit #2 and unit #3 has SW option for added functionality as ASI in and QAM out. VSB RF is default modulation format.

6.1.3 Installation of ETX-200 units through a switch with DHCP with possibility for remote management over VPN connection between office and Head end.

ETX-200 connected through a switch with DHCP

VPN connection



NOTE! If you have questions about how to set up the VPN connection ask your network administrator for detailed information.

7 SW options

It's possible to upgrade your ETX-200 with one or more SW options. Below you can read about available optons. For price list, contact your distributor, see www.a2b.se , Partners.

In the System menu you can see what SW options there are in the ETX-200.

7.1 EXM-Basic, Basic Functionality

If you have purchased a ETX-200 without any SW options you have this basic entitlement which include DVB-T input and
analogue output. ASI output is available. ASI input is disabled.

7.2 EXM-RC, Remux and QAM out

This SW option allows you to do remuxing and QAM modulation.

7.3 EXM-RT, Remux and COFDM out

This SW option allows you to do remuxing and get COFDM modulation.

7.4 EXM-RIPout, Remux and IPTV out

This SW option allows you to do remuxing and get IPTV out.

7.5 EXM-AV, Audio/Video out

This SW option allows you to get A/V out at the back plane A/V connector.

7.6 EXM-ALL, software package.

This SW option include EXM-RC, EXM-RT, EXM-RIPout and EXM-AV

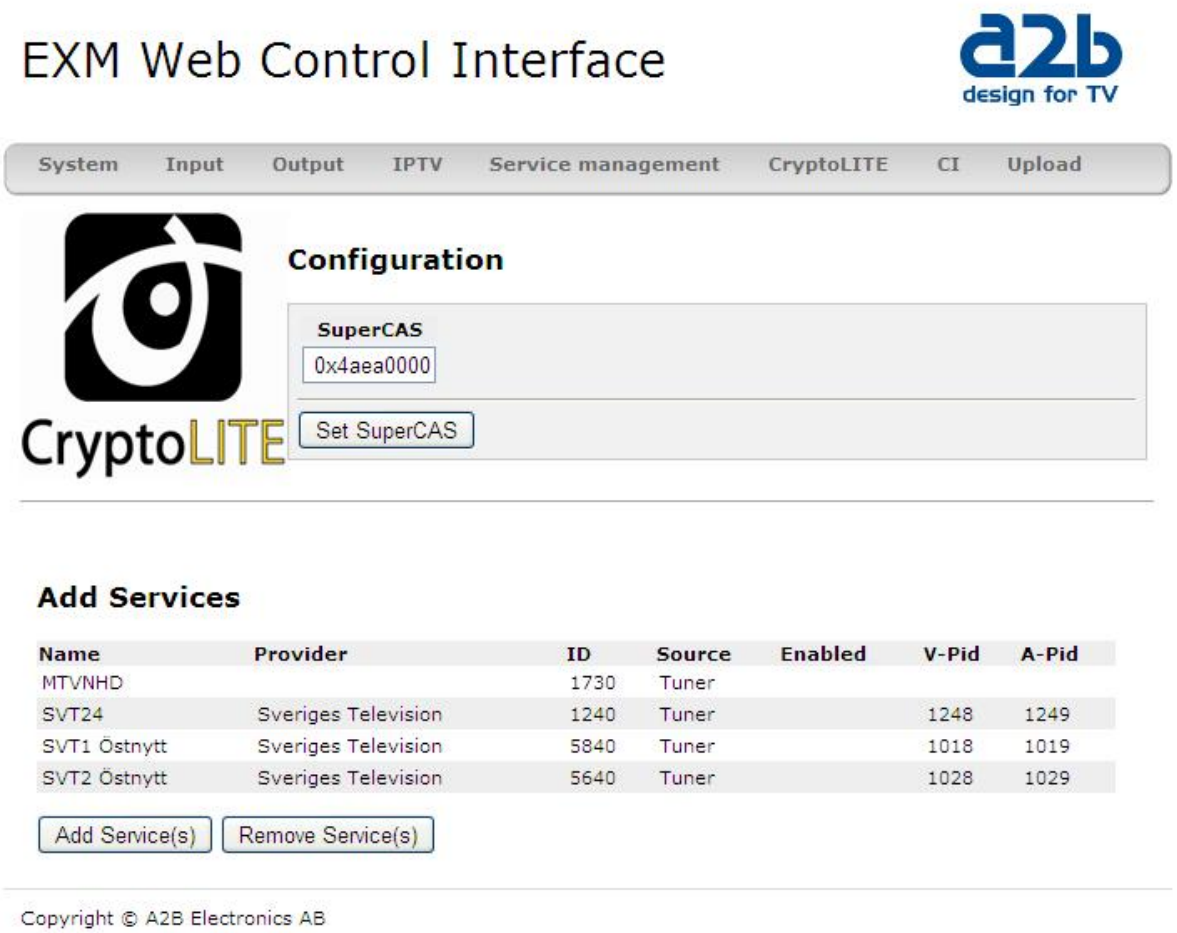
7.7 EXM-Demo, software package

30 days evaluation SW option (include same options as EXM-ALL).

7 SW options (continued)

7.8 EXM-CL, CryptoLITE

This SW option allows you to encrypt channels out in Cryptoguard in a mux without any need for an encryption server. For more information please contact Cryptoguard, phone +46-(0)971-10735

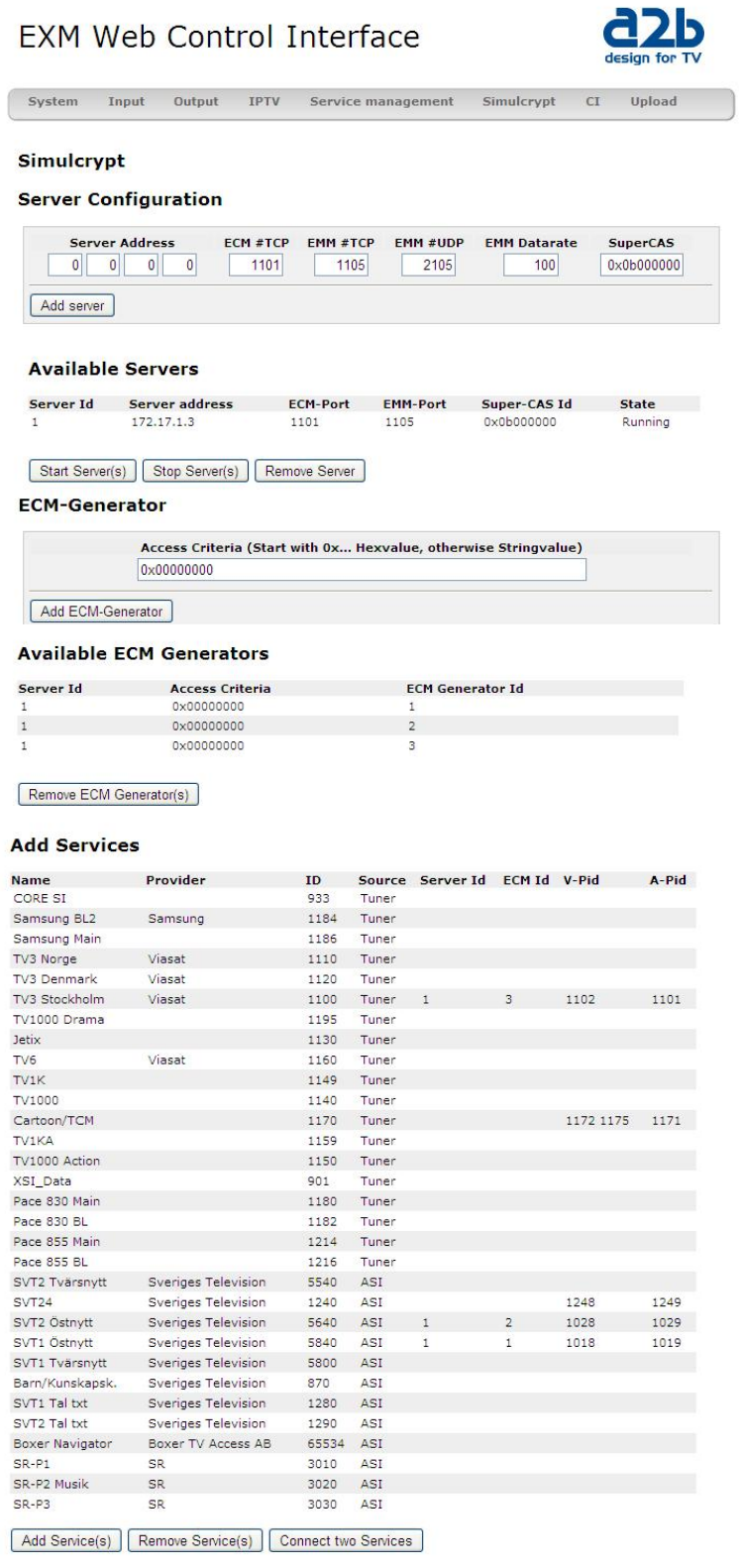


7 SW options (continued)

7.9 EXM-SC, Simulcrypt

This SW option allows you to encrypt a Mux in an EXM unit. When this SW option is uploaded to the unit a new menu will appear (see below).

NOTE! Does not include the encryption equipment such as encryption server, SMS etc.

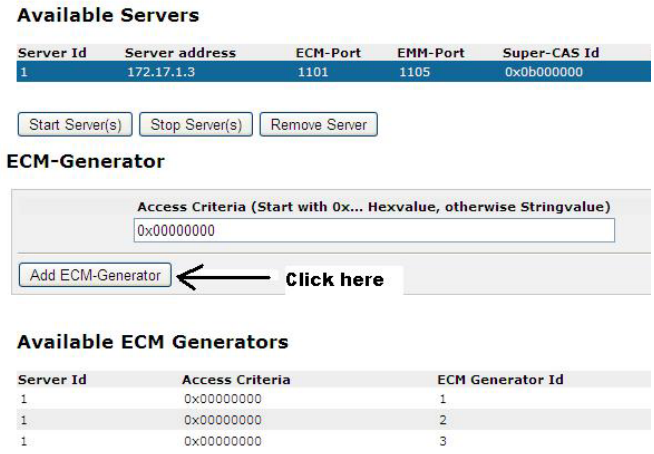

EXM Web Control Interface
a2b design for TV
System Input Output IPTV Service management Simulcrypt CI Upload
Simulcrypt
Server Configuration
Server Address ECM #TCP EMM #TCP EMM #UDP EMM Datarate SuperCAS
0 0 0 0 1101 1105 2105 100 0x0b000000
Add server
Available Servers
Server Id Server address ECM-Port EMM-Port Super-CAS Id State
1 172.17.1.3 1101 1105 0x0b000000 Running
Start Server(s) Stop Server(s) Remove Server
ECM-Generator
Access Criteria (Start with 0x... Hexvalue, otherwise Stringvalue)
0x00000000
Add ECM-Generator
Available ECM Generators
Server Id Access Criteria ECM Generator Id
1 0x00000000 1
1 0x00000000 2
1 0x00000000 3
Remove ECM Generator(s)
Add Services
Name Provider ID Source Server Id ECM Id V-Pid A-Pid
CORE SI 933 Tuner
Samsung BL2 Samsung 1184 Tuner
Samsung Main 1186 Tuner
TV3 Norge Viasat 1110 Tuner
TV3 Denmark Viasat 1120 Tuner
TV3 Stockholm Viasat 1100 Tuner 1 3 1102 1101
TV1000 Drama 1195 Tuner
Jetix 1130 Tuner
TV6 Viasat 1160 Tuner
TV1K 1149 Tuner
TV1000 1140 Tuner
Cartoon/TCM 1170 Tuner 1172 1175 1171
TV1KA 1159 Tuner
TV1000 Action 1150 Tuner
XSI_Data 901 Tuner
Pace 830 Main 1180 Tuner
Pace 830 BL 1182 Tuner
Pace 855 Main 1214 Tuner
Pace 855 BL 1216 Tuner
SVT2 Tvärsnytt Sveriges Television 5540 ASI
SVT24 Sveriges Television 1240 ASI 1248 1249
SVT2 Östnytt Sveriges Television 5640 ASI 1 2 1028 1029
SVT1 Östnytt Sveriges Television 5840 ASI 1 1 1018 1019
SVT1 Tvärsnytt Sveriges Television 5800 ASI
Barn/Kunskapsk. Sveriges Television 870 ASI
SVT1 Tal txt Sveriges Television 1280 ASI
SVT2 Tal txt Sveriges Television 1290 ASI
Boxer Navigator Boxer TV Access AB 65534 ASI
SR-P1 SR 3010 ASI
SR-P2 Musik SR 3020 ASI
SR-P3 SR 3030 ASI
Add Service(s) Remove Service(s) Connect two Services
Copyright © A2B Electronics AB

7 SW options (continued)

7.9 EXM-SC, Simulcrypt (cont.)

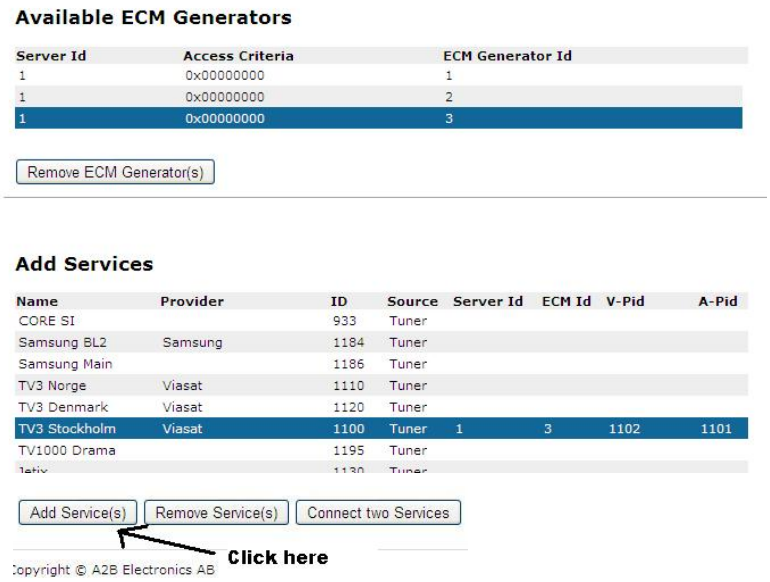
The setup of encryption of services with Simulcrypt is described below:

1. Make the necessary connection between the EXM unit and the encryption server. For more information about **[Server configuration]**, please refer to your provider of the CA system.
2. When connected to a CA server and that server is running you click on the line with the ”Running server” you want to use. Ensure that line is ”marked” dark blue.
3. Click on **[Add ECM Generator]** to create one ECM generator.
4. Repeat step 2 and step 3 above to create more ECM generators. You must create one ECM generator for each service to encrypt.



5. Click on the line with the first ECM generator (1) to mark that ECM generator. Click on the service under **[Add Services]** that you want to encrypt and click on **[Add Service(s)]**

6. Repeat step 5 to encrypt the rest of the services that should be encrypted



8 SNMP

With the FW 1.2 in the ETX-200 you are able to use the SNMP Interface for monitoring the ETX-200. To get the SNMP menu on the unit you write for example: 192.168.0.20/snmp.html in the web browser.

In the [**SNMP agent]** part of the menu you can start the SNMP agent, select Listen port, Read community, Write community.

In the [**SNMP traps]** part of this menu you can select Dest. Address (IP address to the PC that is listening), Dest. port and Community.

NOTE! *To be able to use the SNMP you need to get a 3rd party program. One program you can download for trial is http://www.wtcs.org/snmp4tpc/getif.htm .*

9 Technical specification

ETX-200 DVB-T Terrestrial processor

Connectors and Interfaces

Control and IP out connector	RJ-45, 10/100 BaseT
RF input connector	F female, 75 Ω
RF output connector	F female, 75 Ω
ASI input connector	BNC female, 75 Ω
ASI output connector	BNC female, 75 Ω
CAM connector	PCMCIA (5 VDC)
LED Indicator lights	Power on, COFDM/Rx error, Tx/Access error
SNMP Interface	RJ-45, 10/100 BaseT
A/V out connector	3,5 mm 4 pole

COFDM Terrestrial Receiver

Input frequency	50 - 858 MHz (centre freq.)
Input freq step size	250 kHz
Input level range	-60 to -30 dBm *)
Input impedance	75 Ω
Input return loss	12 dB
C/N limit	18 dB *)
Bandwidth	6/7/8 MHz
DVB compliance	DVB-T
Co/adj channel PAL	Compliant to Nordig 2 PAL
Automatic mode change recovery	Yes
Echo performance	Compliant to Nordig 2 unified

*) QEF reception with test signal: 8k, 64QAM, 1/8 guard interval, 2/3 FEC

RF Modulation (analogue)

Standards	B/G, I, D/K, L, M/N
Sound	Mono, NICAM stereo or A2/A2* stereo
Modulation video	VSB AM, neg. or pos.
Modulation mono	Audio FM or AM
Output frequency	47 – 862 MHz
Output level	≥ 110 dBuV (47-470 MHz) ≥105 dBuV (470-862 MHz)
S/N weighted	≥ 57 dB
C/N, broadband	≥ 70 dB
NICAM standards	NICAM 728 (EN 300 163)
Power ratio (Vision/NICAM carrier)	B/G -20dB, I -24dB, D/K -24dB, L -27dB
Tolerance	+/- 1dB
Impedance	75 Ω

QAM modulation (Option)

QAM modes	16, 32, 64, 128 and 256 QAM
Symbol rate	4 – 7.2 Mbaud/s
MER (at RF out)	> 38 dB for 256-QAM
DVB compliance	DVB-C (EN 300 429)
QAM output frequency	47 - 862 MHz (1 kHz step)
Output level	Min 105 dBuV (47-470 MHz) Min 100 dBuV (470-862 MHz)
PSI/SI management	Yes
Remultiplexing	Yes

COFDM modulation (Option)

COFDM mode	2K
Guard interval	1/32
FEC	7/8
MER	>34 dB
DVB compliance	DVB-T (EN 300 744)
Max output bit rate	32 Mbit/s
Output frequency	47 - 862 MHz (1 kHz step)
Output level	Min 100 dBuV (47-470 MHz) Min 95 dBuV (470-862 MHz)
PSI/SI management	Yes
Remultiplexing	Yes

IPTV out (Option)

Max input bit rate	55 Mbit/s
Max output bit rate	55 Mbit/s *)
Connector	RJ 45 (same as control)
Output protocol	UDP, Multicast
PSI/SI management	Yes
Remultiplexing	Yes

*) With single TS input to IP

Miscellaneous

Power supply	7,5 VDC nom. (6-10 VDC)
Power consumption	Typ. 15 W
Dimensions	165x105x37 mm (ex. connectors)
Weight	Approx. 390 g
Controller	Embedded web server
Operating temperature	-20 to +50°C, non condensing

This specification may change without prior notice.

ASI input(option) - output

ASI bit rate	270 Mbit/s
Max payload bitrates:	
Max input bit rate	55 Mbit/s *)
Max output bit rate	55 Mbit/s *)
PCR restamping	Yes
PSI/SI management	Yes
Remultiplexing	Yes

*) The input, output and throughput bitrate is highly dependent on the type of application that is run in the unit.

MPEG Decoder - Audio

Supported formats	MPEG 1 layer II, AAC HE,
Output	Selection of Dual mono in, Stereo or Mono
Impedance	< 100 Ω
Output level	0 dBu

MPEG Decoder - Video

Supported formats	MPEG2 MP@ML, MPEG4 h.264 AVC
Output standards	PAL, SECAM or NTSC
Impedance	75 Ω
Output level	1 Vpp @ 75 Ω
Aspect Ratio	Letterbox, Pan/Scan, or conversion Combined (14:9) programmable, WSS
Teletext	Insertion in VBI
Subtitling	Teletext or DVB subtitling
Decryption	Common Interface

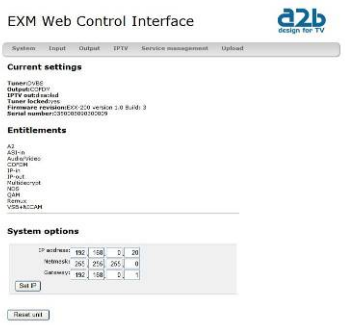
Remultiplexing (option)

Each ETX-200 contains a remultiplexer for 2 incoming transport streams. The transports streams can be received from a terrestrial network and from the ASI input. All PSI/SI regeneration in a Head end system is handled over IP.

Following components can be remultiplexed:

Audio, Video, Subtitling, PAT, PMT, NIT, EIT, TDT, CAT, SDT

Graphical User Interface (GUI)



Graphical User Interface for easy set up of complex systems. Simple handling of remultiplexing and creation of new multiplexes from any input.

Default setting of PSI/SI tables to avoid clashes in the output multiplexes.
Simple structure for setting input, output and processing parameters.

Each ETX-200 contains an embedded web server. Standard web browsers (Internet Explorer, Mozilla Firefox etc.) are supported.

With FW 1.2 in your ETX-200 you also can use a third part program for surveillance via the SNMP interface.

This specification may change without prior notice.

10 Declaration of Conformity

The document for Declaration of Conformity you will find at www.a2b.se.

Further information at www.a2b.se.

11 Glossary

DVB	Digital Video Broadcasting (Standardization body)
MPEG-2	Compression format for digital TV
MPEG-4	Compression format for digital-TV (SD and HD)
H.264 AVC	Format for compression of the video in HDTV
VSB	Vestigal Side Band (adjacent channel RF-modulation)
ASI	Asynchronous Serial Interface (High Speed Interface)
NICAM	Digital sound format for analogue TV-transmission
IP	Internet Protocol (defines how data is packetized for Internet broadcast)
IPTV	TV-content packetized for Internet Protocol
DVB-T	Modulation format (COFDM) for terrestrial transmission of digital-TV
QAM	Modulation standard for digital-TV in cable networks
COFDM	Modulation standard for digital-TV in terrestrial networks
Remultiplexing	Way of recombining services from different multiplexes
DHCP	Dynamic Host Configuration Protocol is a protocol used by networked devices (*clients*) to obtain the parameters necessary for operation in an Internet Protocol network. This protocol reduces system administration workload, allowing devices to be added to the network with little or no manual configuration.
Common Interface	Connector for a PCMCIA module used for decrypting encrypted TV-programs. Modules should comply with the DVB_CI standard
SD	Standard definition TV (576i in Europe)
HD	High Definition TV (720p or 1080i)
LCN	Logical Channel Numbers (method to give specific TV-programs a number that defines the order they appear on a TV or set-top box
VPN	Virtual Private Network (secure point to point connection in an unsecure network)
SMS	Service Management System (system for handling smartcards).
SNMP	Simple Network Management Protocol (SNMP) is used in network management systems to monitor network-attached devices for conditions that warrant administrative attention. SNMP is a component of the Internet Protocol Suite as defined by the Internet Engineering Task Force (IETF). It consists of a set of standards for network management, including an application layer protocol, a database schema, and a set of data objects

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